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FIG.1

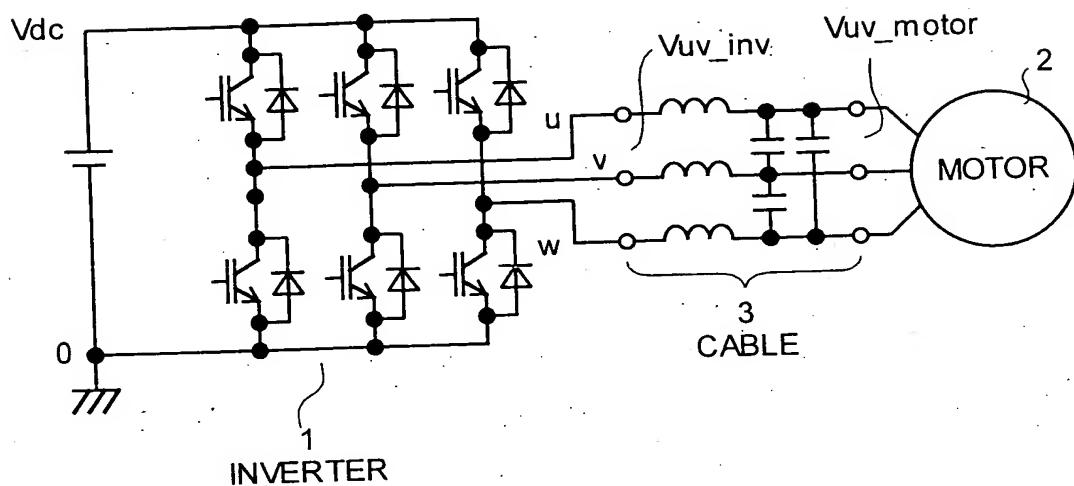


FIG.2

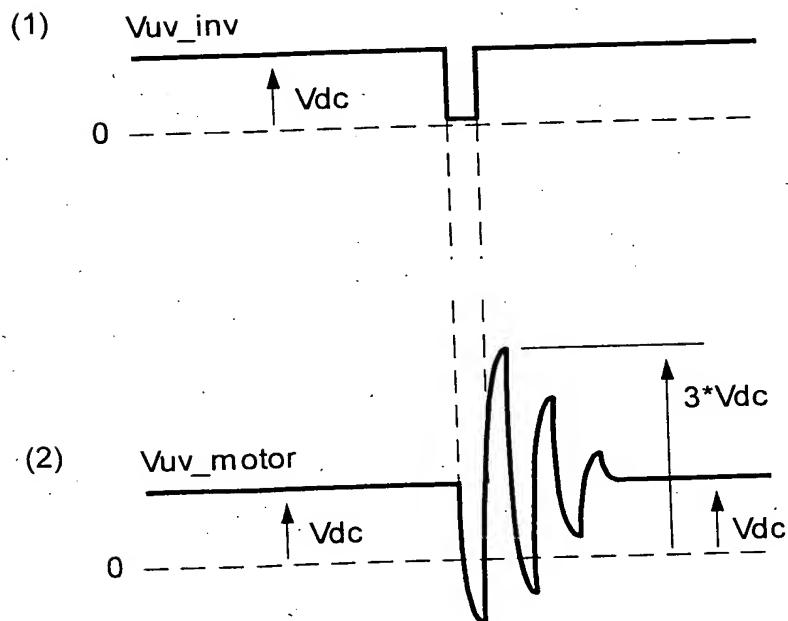


FIG.3

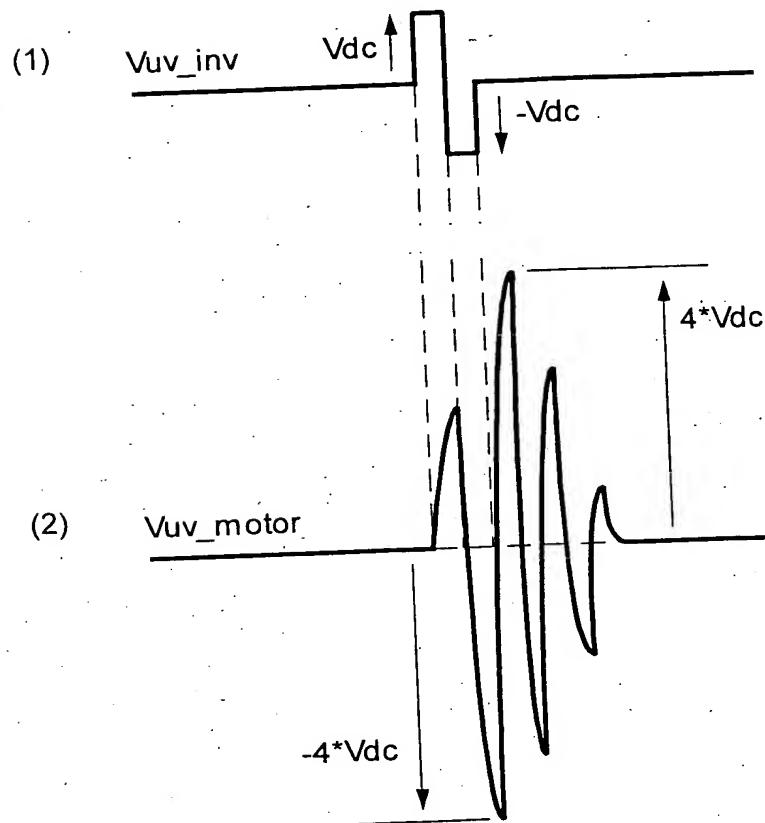
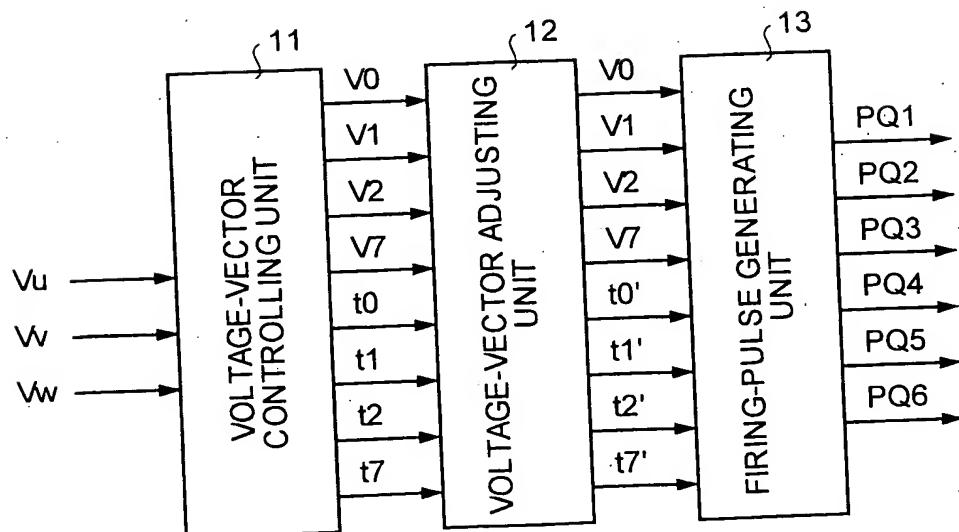


FIG.4



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FIG.5

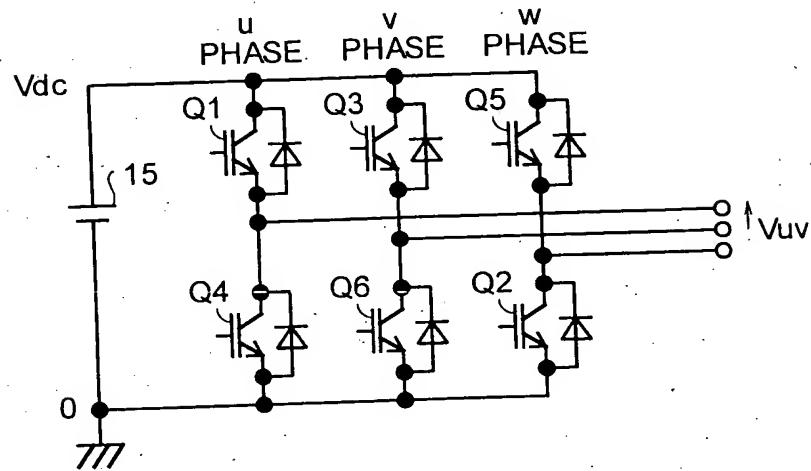


FIG.6

STATE	TURNED-ON IGBT			VOLTAGE VECTOR
	u PHASE	v PHASE	w PHASE	
0	Q4	Q6	Q2	V0
1	Q1	Q6	Q2	V1
2	Q1	Q3	Q2	V2
3	Q4	Q3	Q2	V3
4	Q4	Q3	Q5	V4
5	Q4	Q6	Q5	V5
6	Q1	Q6	Q5	V6
7	Q1	Q3	Q5	V7

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FIG.7

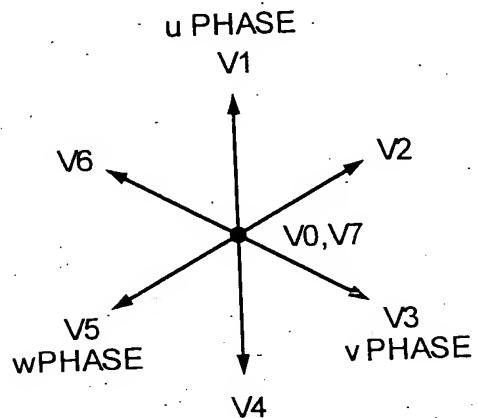


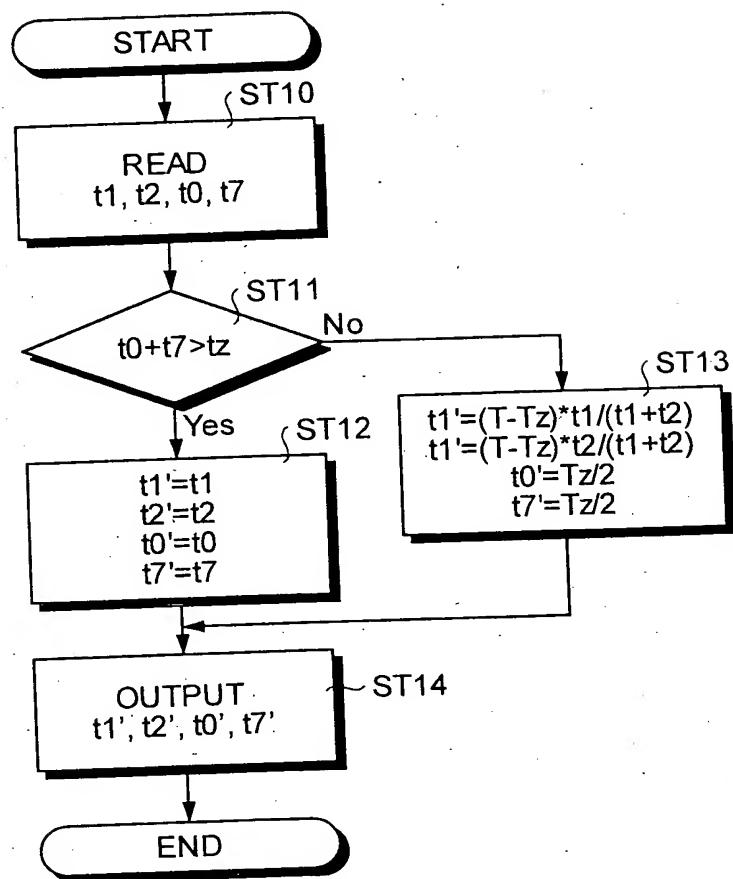
FIG.8

PHASE θ	VOLTAGE VECTOR
$0 \leq \theta < \pi / 3$	V1, V2, V0, V7
$\pi / 3 \leq \theta < 2\pi / 3$	V2, V3, V0, V7
$2\pi / 3 \leq \theta < \pi$	V3, V4, V0, V7
$\pi \leq \theta < 4\pi / 3$	V4, V5, V0, V7
$4\pi / 3 \leq \theta < 5\pi / 3$	V5, V6, V0, V7
$5\pi / 3 \leq \theta < 2\pi$	V6, V1, V0, V7

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FIG.9

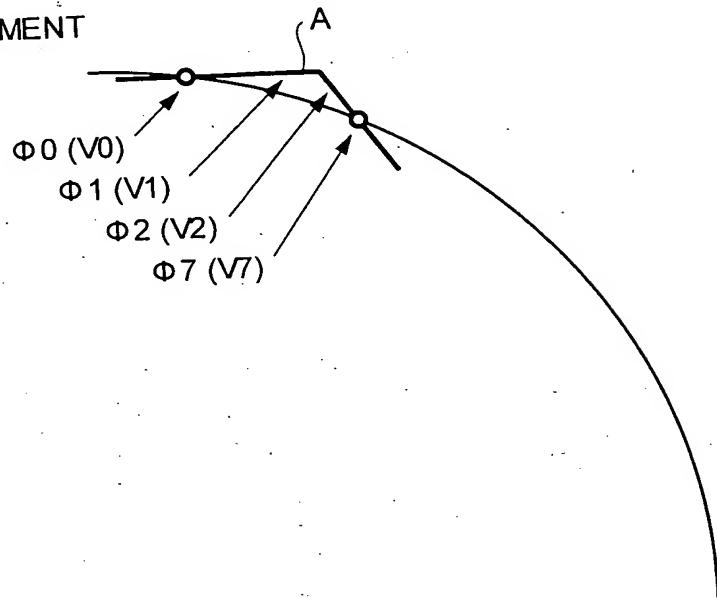


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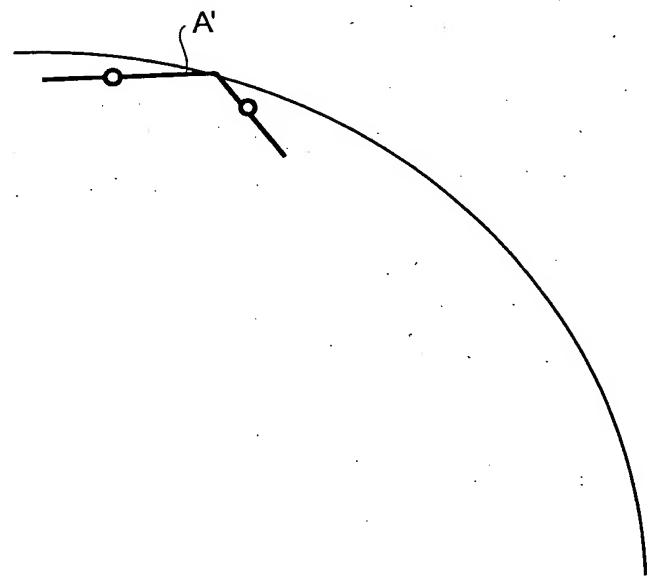
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FIG. 10

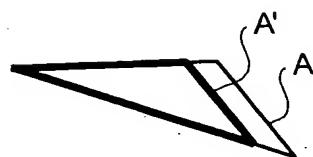
(1) BEFORE ADJUSTMENT



(2) AFTER ADJUSTMENT



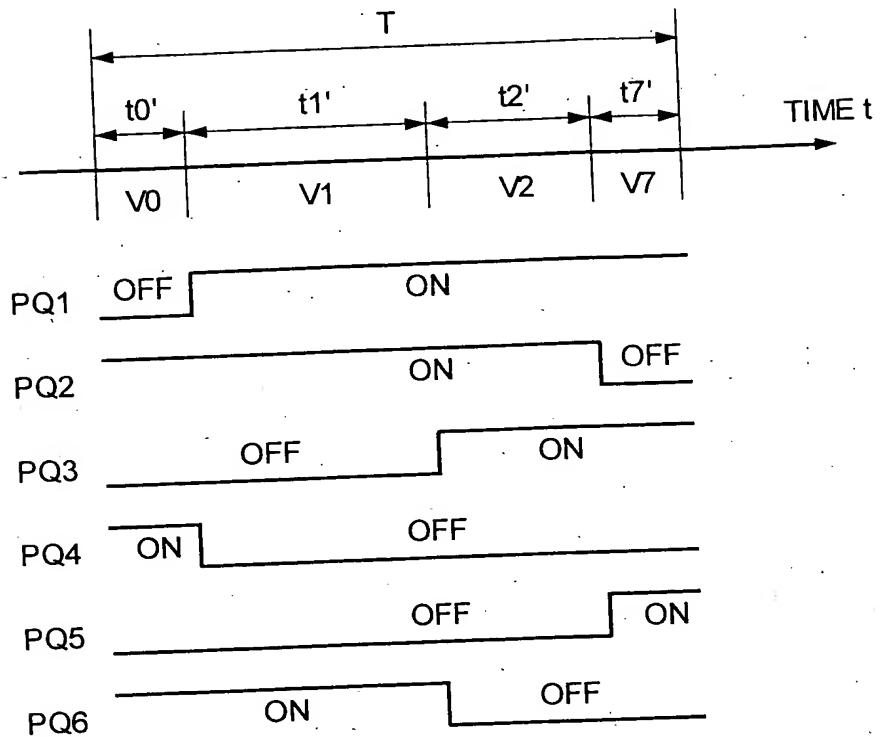
(3) COMPARE



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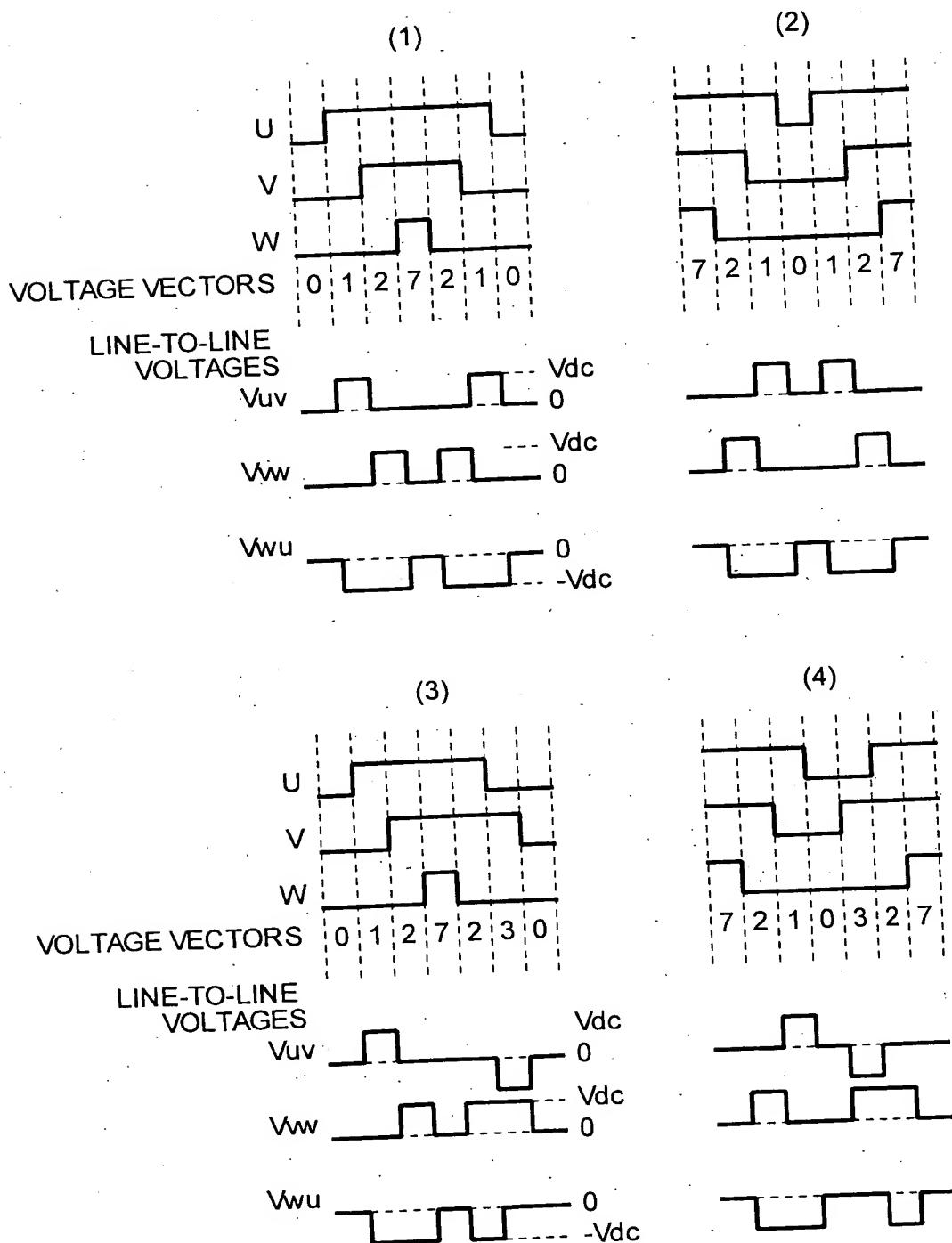
FIG. 11



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FIG. 12



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FIG.13

OUTPUT TIME OF ZERO-VOLTAGE VECTORS	OUTPUT TIME OF VOLTAGE VECTORS OTHER THAN ZERO-VOLTAGE VECTORS	LINE-TO-LINE VOLTAGE PATTERN 1	LINE-TO-LINE VOLTAGE PATTERN 2
SHORT	SHORT	(1-1)	(2-1)
SHORT	LONG	(1-2)	(2-2)
LONG	SHORT	(1-3)	(2-3)
LONG	LONG	(1-4)	(2-4)

Diagram illustrating the relationship between the output time of zero-voltage vectors and the output time of other voltage vectors, and the resulting line-to-line voltage patterns.

The table shows four categories based on the combination of short and long output times for zero-voltage and other voltage vectors:

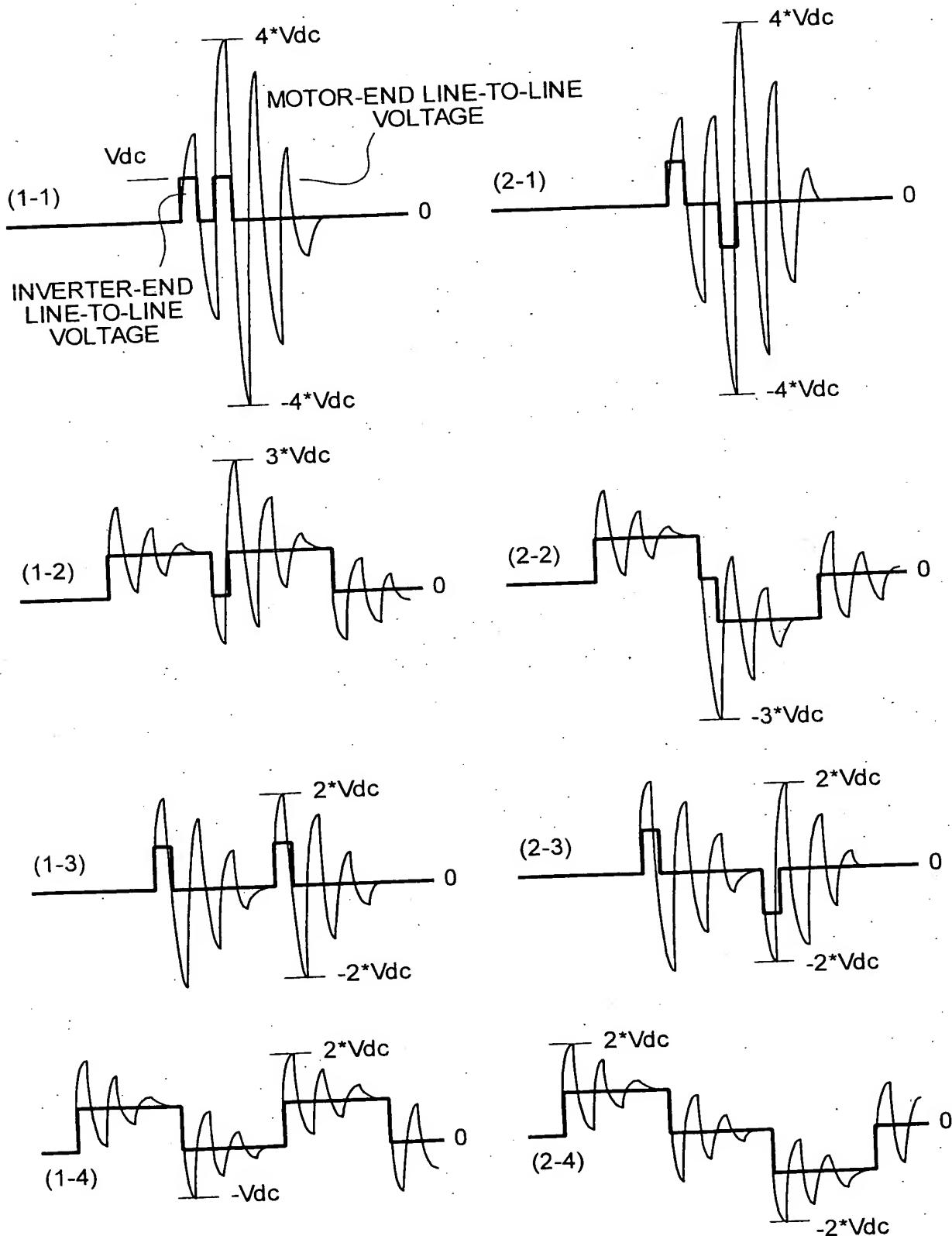
- Category 1: Short zero-voltage vector time, short other voltage vector time. Patterns (1-1) and (2-1) show a single pulse.
- Category 2: Short zero-voltage vector time, long other voltage vector time. Pattern (1-2) shows a pulse followed by a long period of zero voltage. Pattern (2-2) shows a pulse followed by a long period of non-zero voltage.
- Category 3: Long zero-voltage vector time, short other voltage vector time. Pattern (1-3) shows a short pulse followed by a long period of zero voltage. Pattern (2-3) shows a short pulse followed by a long period of non-zero voltage.
- Category 4: Long zero-voltage vector time, long other voltage vector time. Patterns (1-4) and (2-4) show multiple pulses.

Line-to-line voltage patterns 1 and 2 are shown as waveforms with double-headed arrows indicating the duration of the zero-voltage vector.

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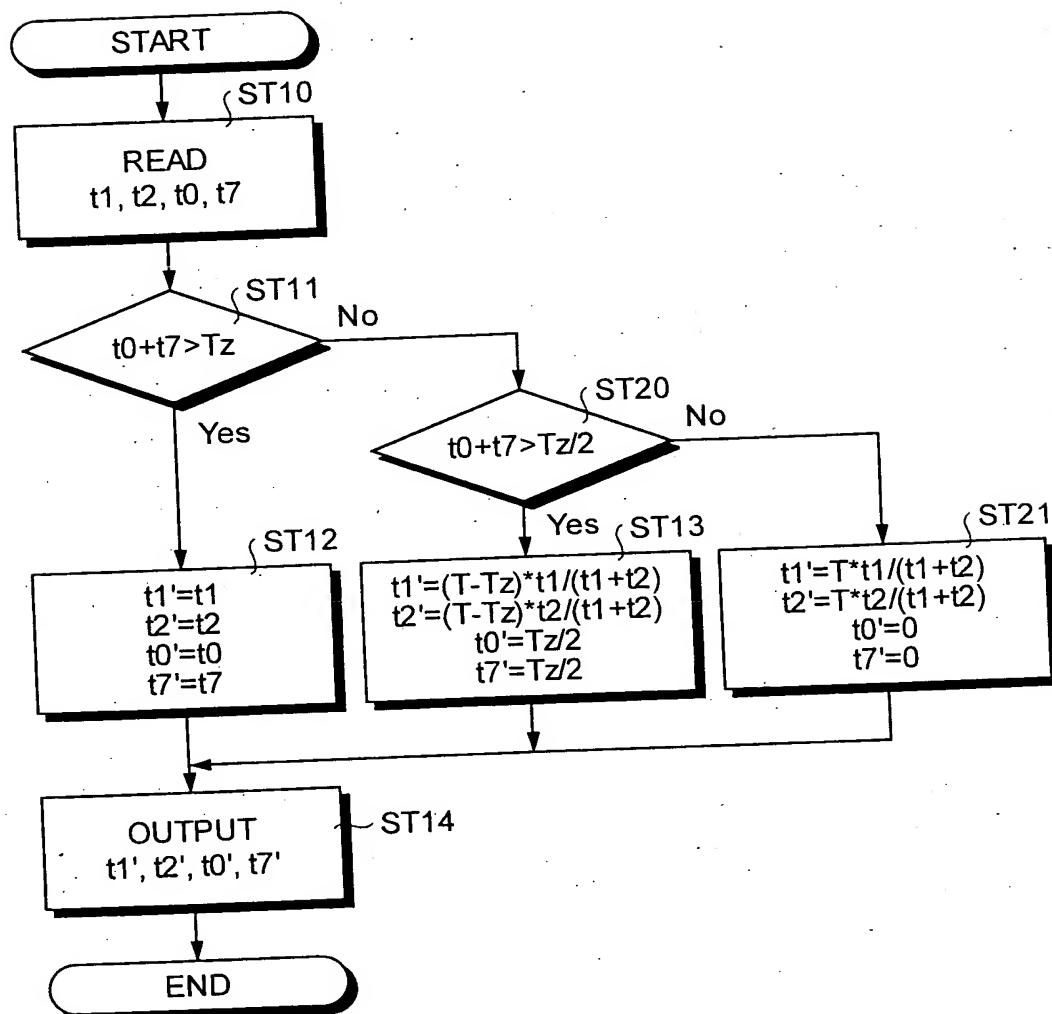
FIG. 14



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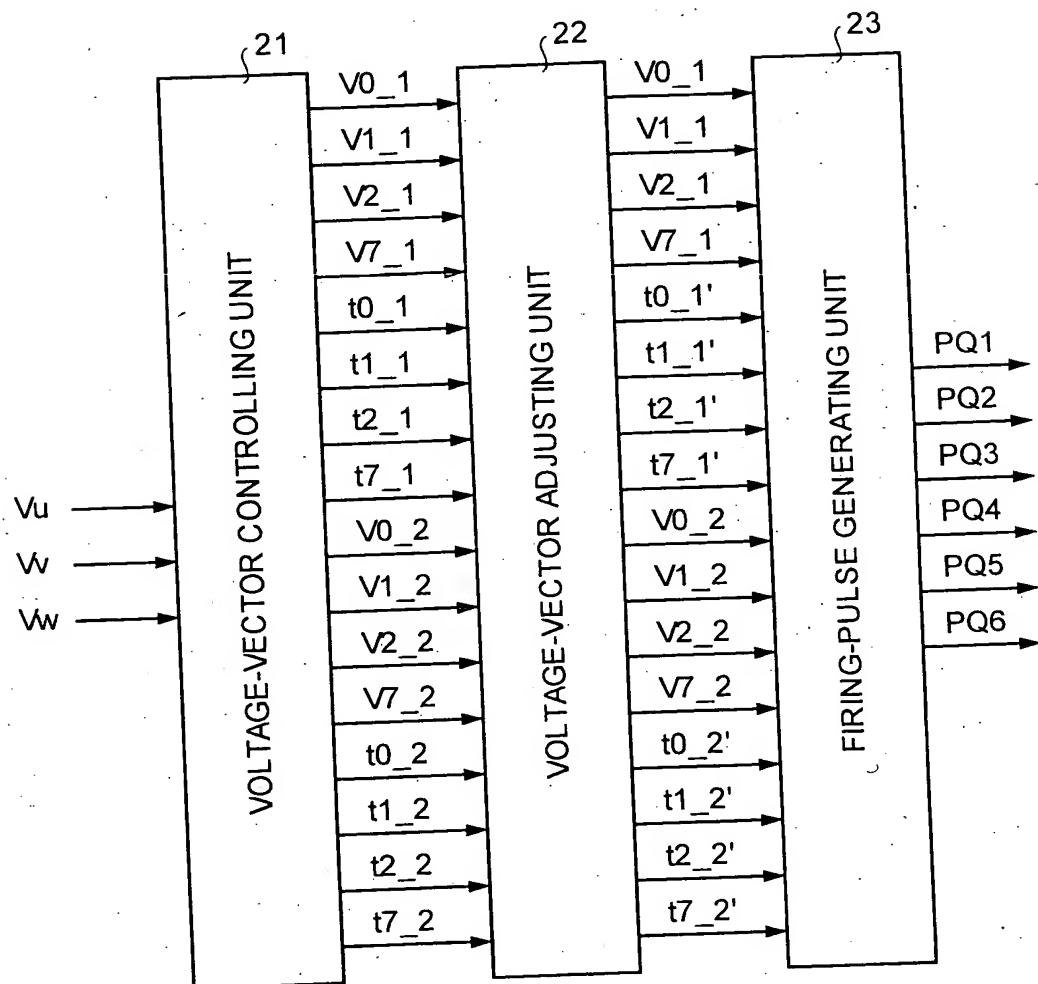
FIG. 15



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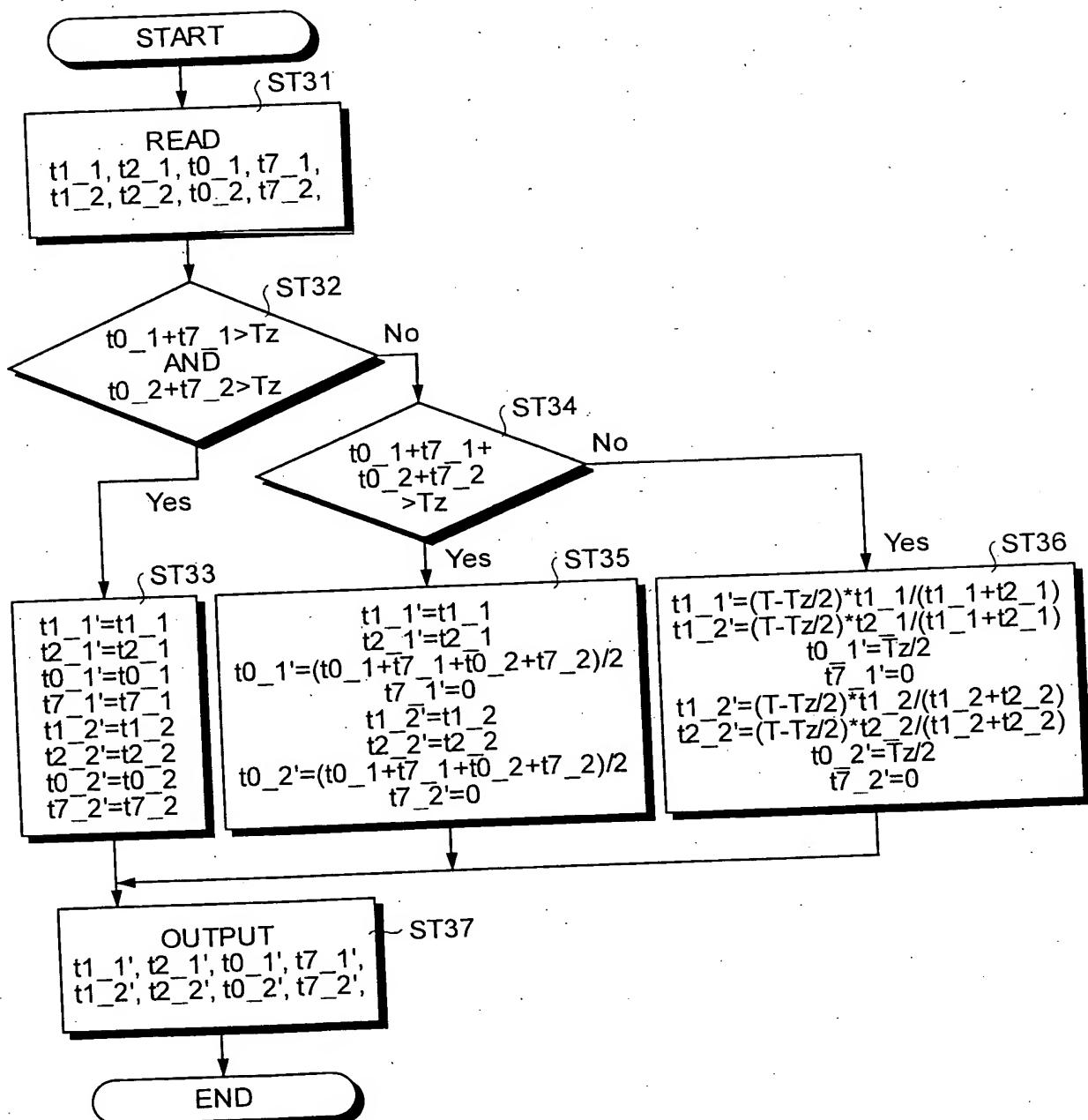
FIG. 16



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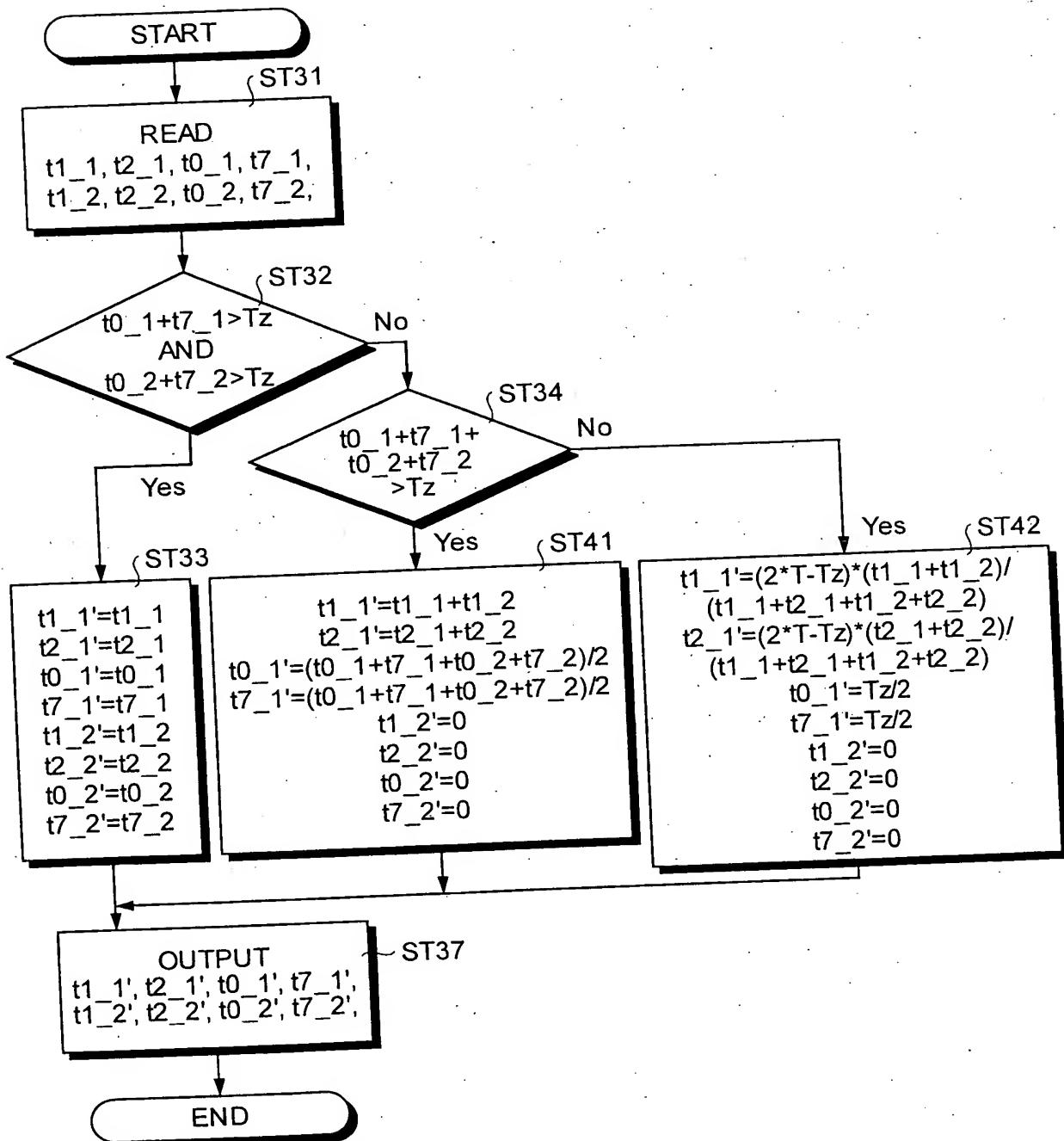
FIG.17



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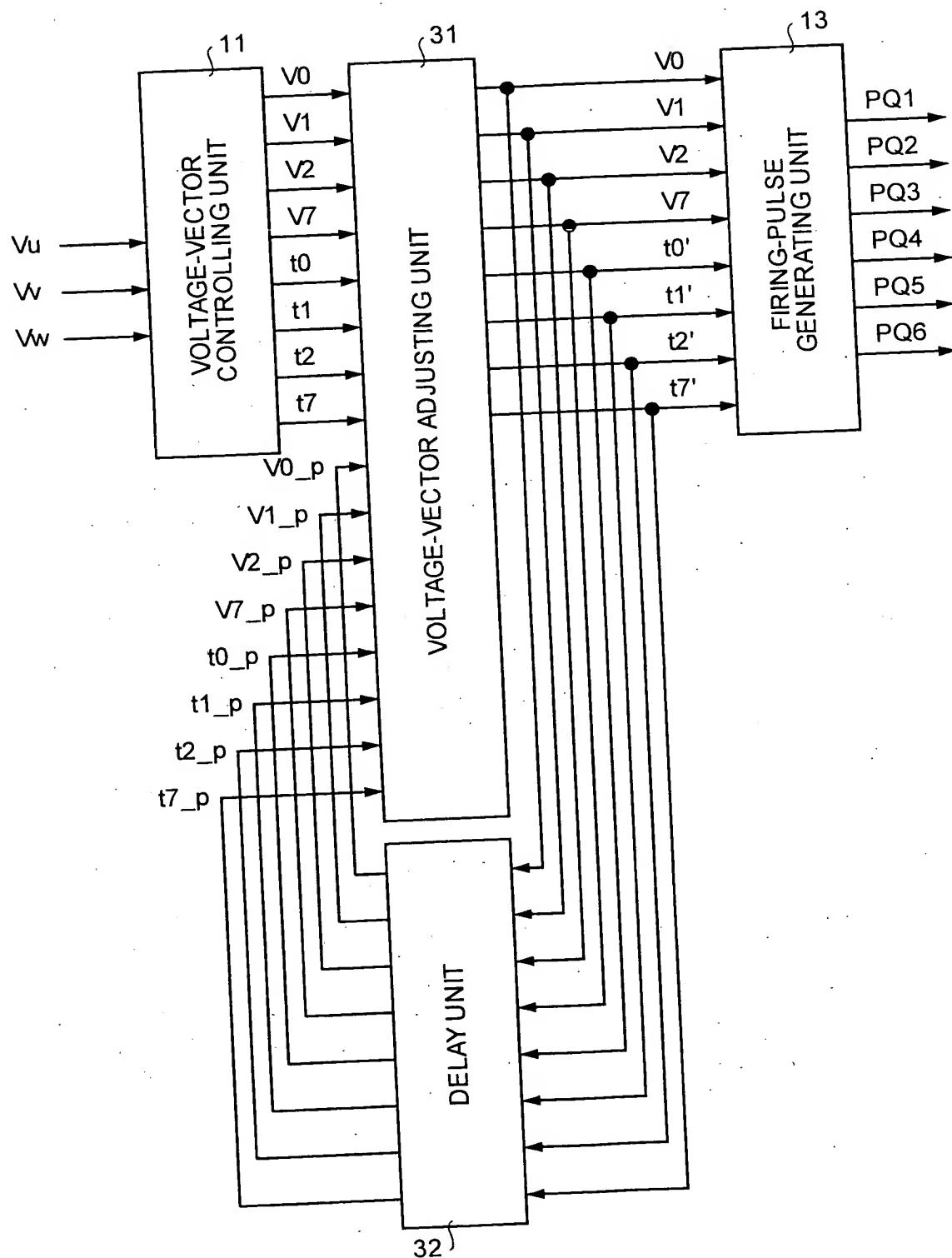
FIG.18



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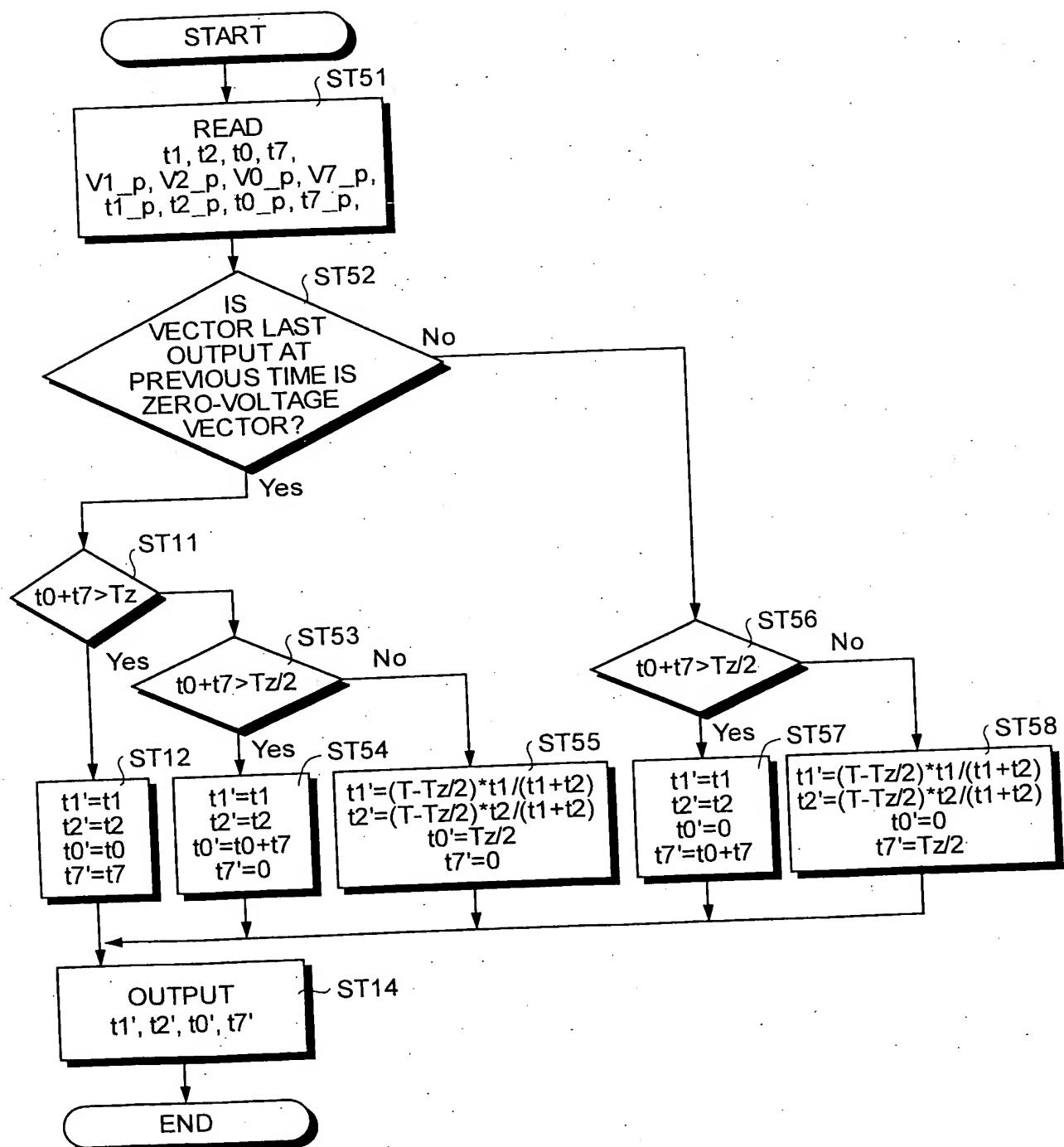
FIG. 19



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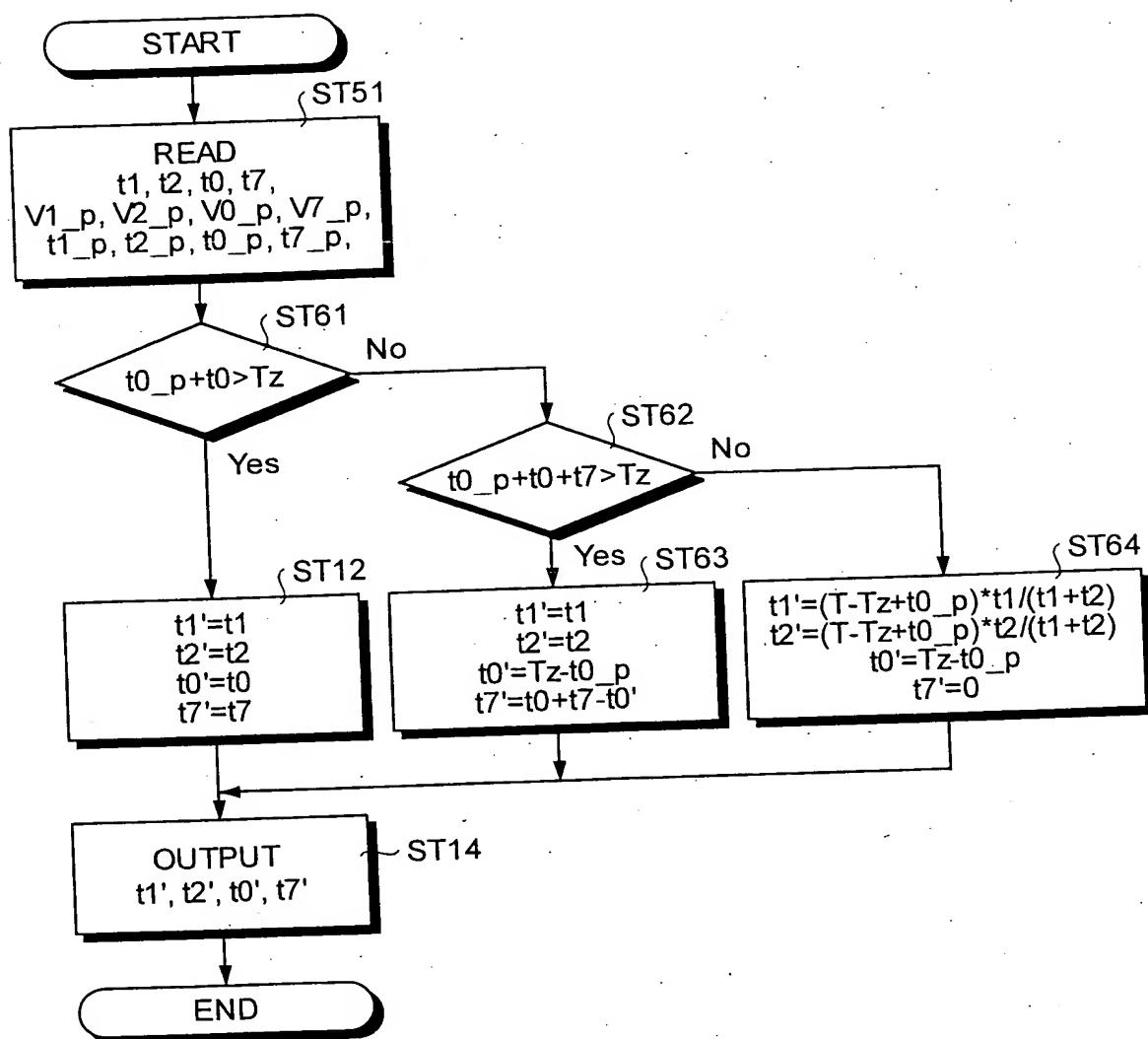
FIG.20



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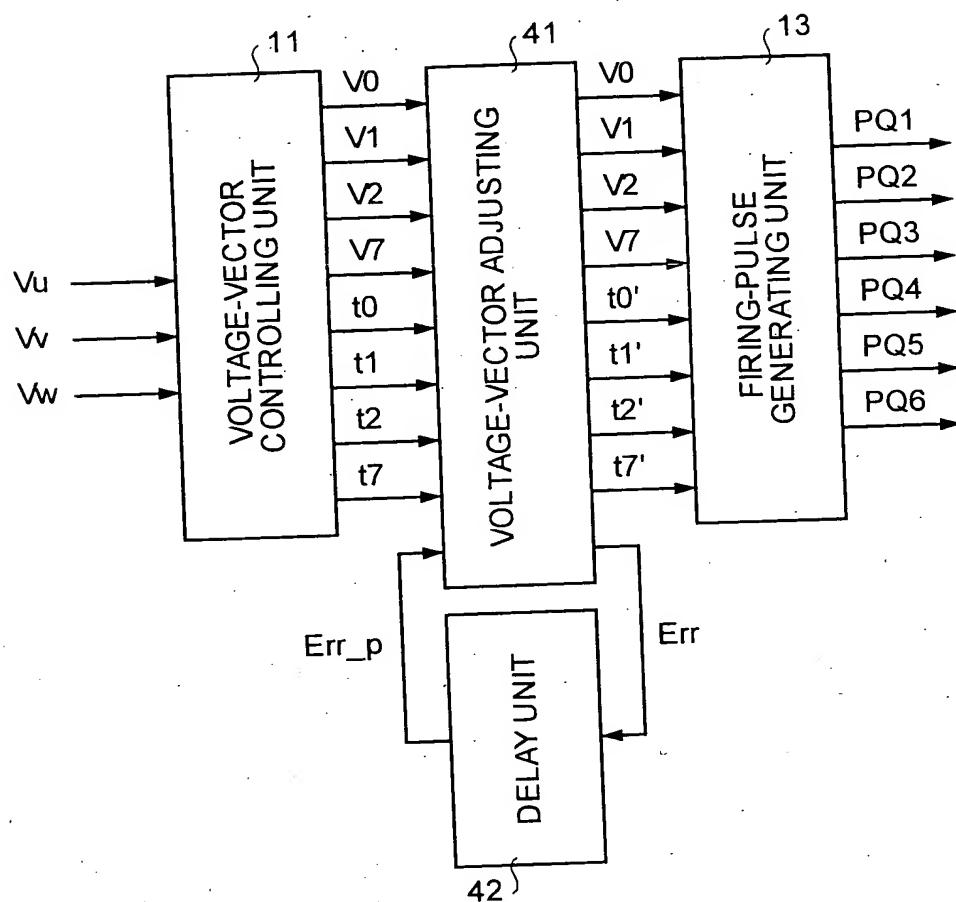
FIG.21



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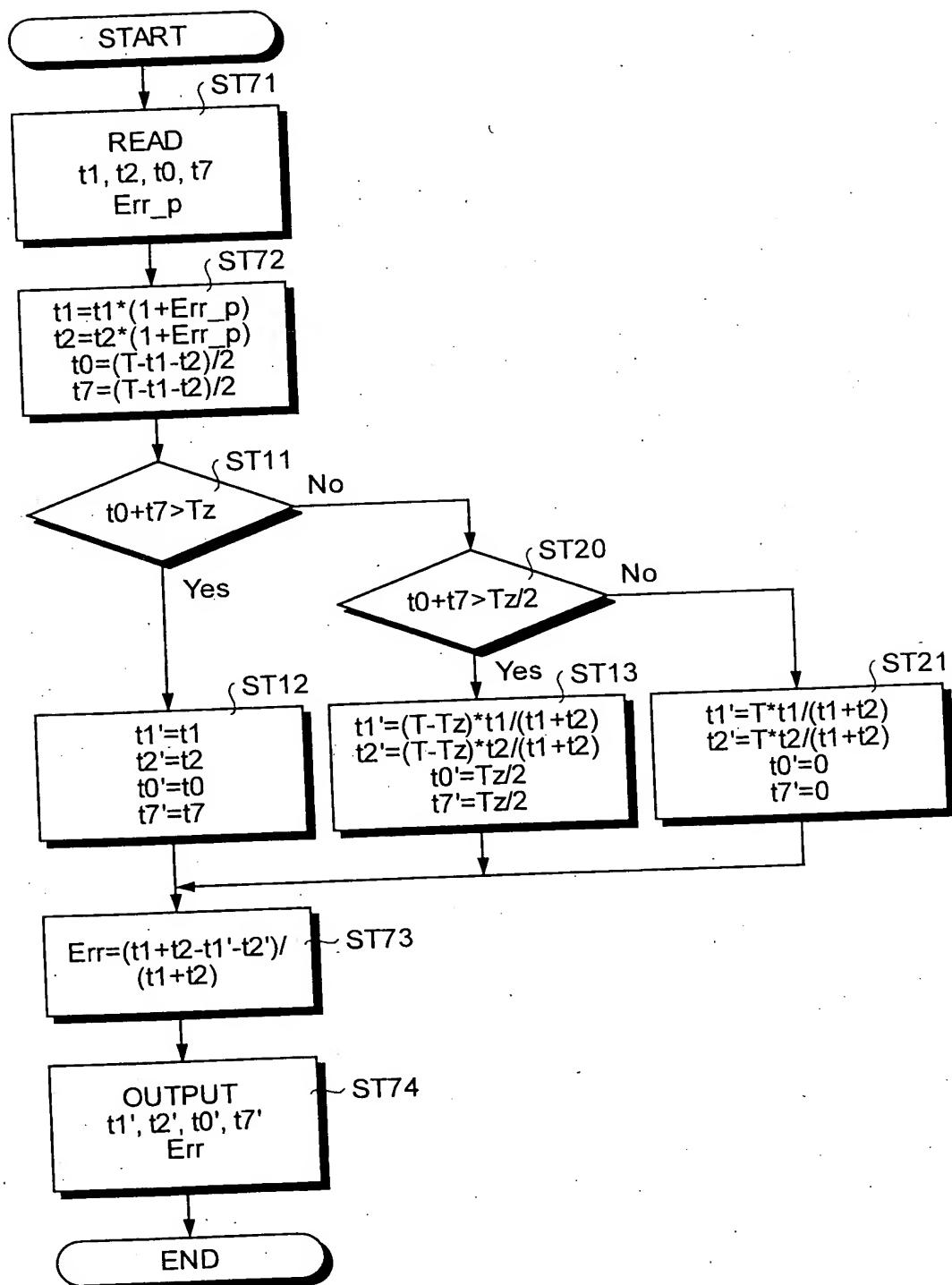
FIG.22



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FIG.23

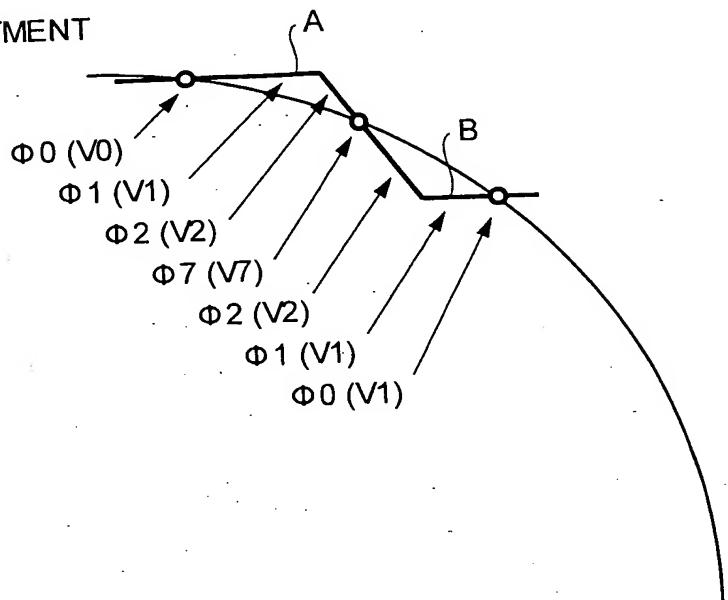


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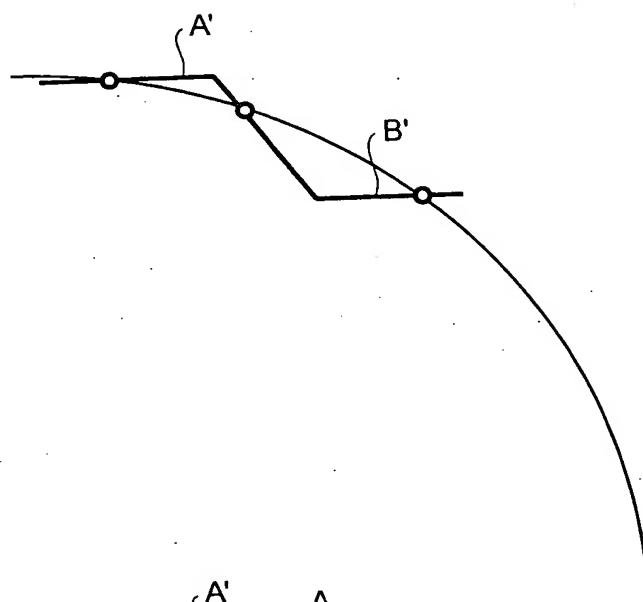
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FIG. 24

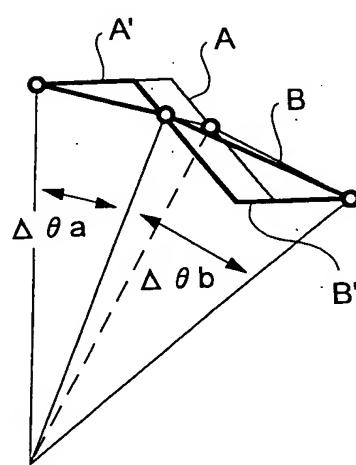
(1) BEFORE ADJUSTMENT



(2) AFTER ADJUSTMENT



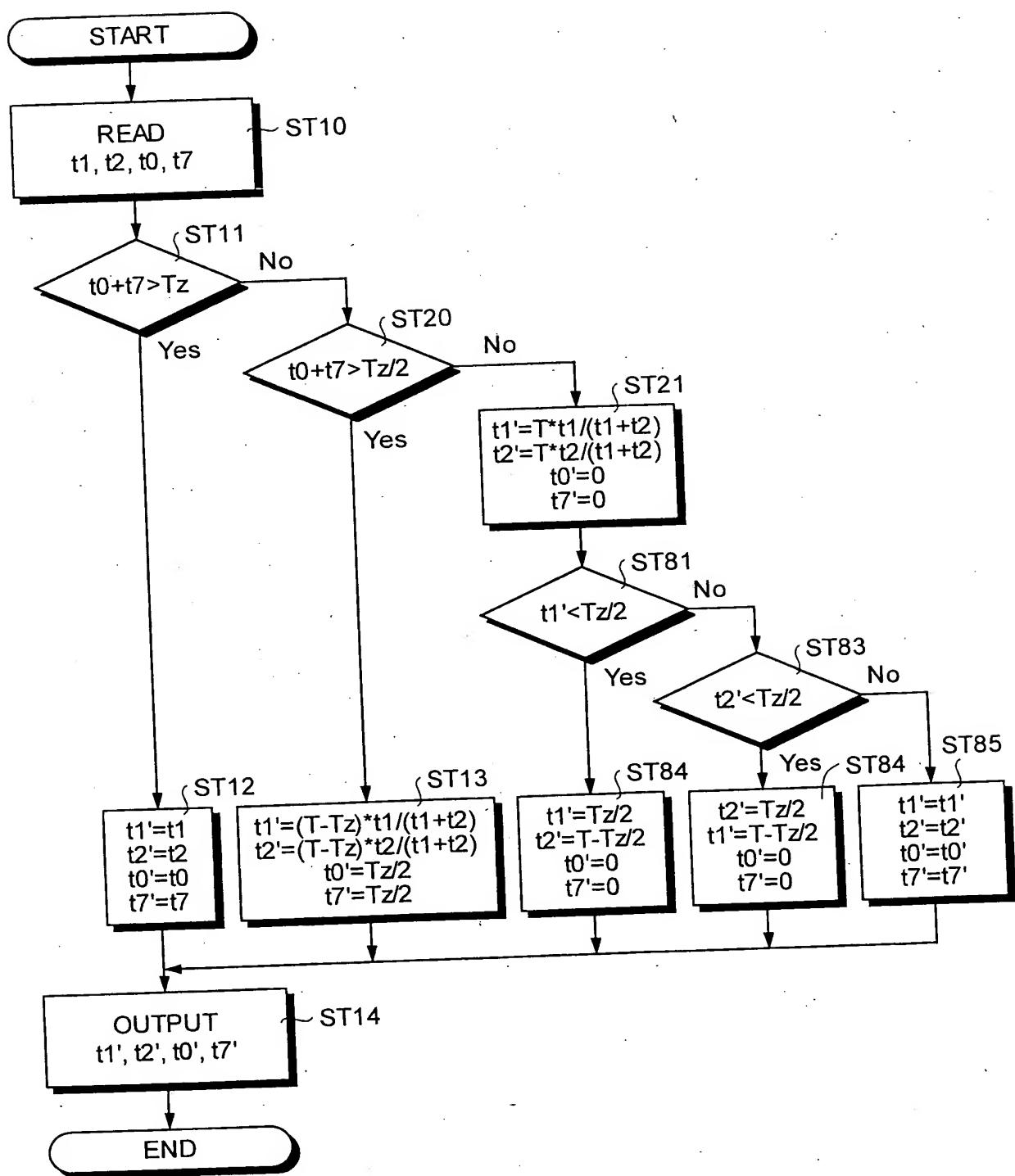
(3) COMPARE



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FIG.25



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